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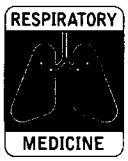

Survival experience of the population needing hospital treatment for asthma or COPD at age 50–54 years

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The aim was to evaluate the differences of mortality among asthma and COPD patients on the basis of the first period of hospitalization of these diseases. A total of 576 916 treatment periods for asthma and COPD between 1972 and 1992 were identified in the discharge register maintained by the National Research and Development Centre for Welfare and Health. Patients aged 50–54 years first treated in hospital in 1977 or later were analysed. There were 6655 new asthma patients of this age, 2727 new COPD patients and 701 new patients in a mixed group (with both diagnoses). Mortality up to the end of 1993 was analysed based on mortality and cause of death data provided by the Central Statistical Office of Finland. Estimated cumulative survival after 10 yr was higher among the asthma patients (83·5% for men and 93·2% for women) and lower among the COPD patients (60·1% and 78·0%) and in the mixed group (62·5% and 74·4%). The main cause of death among the asthmatics was asthma in 12·1% of cases, that among the COPD patients was COPD in 22·1% of cases and that in the mixed group was one or other of these diseases in 39·1% of cases. The prognosis for COPD patients aged 50–54 years requiring hospital treatment is poor. Combination of the data available from the cause of death and hospital discharge registers indicates that obstructive pulmonary diseases may well be of more significance from a public health point of view than the mortality statistics would lead us to believe. The very first hospitalization for COPD calls for a thorough evaluation of the prospects for active treatment and prevention.

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Introduction

The increasing prevalence of asthma, the resulting increased use of hospital services by asthma patients and the costs of such treatment are nowadays recognized as being of economic significance on a national scale (1). Asthma is regarded especially as a disease affecting the younger age bracket in the population, and the current philosophy is that it should be treated at the earliest possible stage (2).

Chronic obstructive pulmonary disease (COPD), on the other hand, is common among the older sectors of the population and those who smoke, giving rise to notable amounts of absence from work and premature retirement and increasing morbidity and mortality from other diseases (3). COPD patients are usually admitted to hospital only when the disease has reached an advanced stage, so that no effective medication is available and long periods have to be spent in hospital (4).

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In the present situation in which all forms of health care are being subjected to stringent cost analysis, it is interesting to examine how much significance can be assigned to the differential diagnosis of asthma, a disease which is amenable to treatment, and COPD, which is commonly regarded as resistant to treatment. The purpose of the present investigation was thus to combine data extractable from the national hospital discharge and cause of death registers for Finland, a country with a population of approx. 5 million, in order to assess the prognosis for 50–54 year old patients hospitalized for the first time for asthma or COPD.

Subjects and Methods

The National Research and Development Centre for Welfare and Health is provided with registration data on all patients treated in hospitals in Finland, including their diagnoses. All treatment periods for which the primary diagnosis was asthma or COPD were collected from the register (International Classification of Diseases, Eighth and Ninth Revision, rubeics 491–493 and 496). A total of 576 916 such periods were recorded between 1972 and 1992.

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Any patient who had had no recorded asthma-related hospital treatment (diagnosis 493) between 1972 and 1976 and was first treated in hospital in 1977 or later and had no COPD-related hospital treatment (diagnoses 491, 492 or 496) between 1977 and 1992 was considered a new asthma patient. These numbered 77 674. Likewise, any patient who had had no recorded COPD-related hospital treatment between 1972 and 1976 and was first treated in hospital in 1977 or later and had no asthma-related hospital treatment between 1977 and 1992 was considered a new COPD patient. These numbered 40 580. There were also 6554 patients who had had no asthma- or COPD-related hospital treatment between 1972 and 1976 and were first treated in hospital in 1977 or later, but who had more than one period of hospital treatment so that both asthma and COPD were recorded as main diagnoses on discharge, and these were placed in a mixed group of new patients. The year of discharge was taken as the index year.

Patients in the age group from 50 to 54 years were analysed. Age was calculated as of the day of first admission, which was also used in the survival analysis. There were 6655 new asthma patients, 2727 new COPD patients and 701 new patients in the mixed group in this age group. Mortality up to end of 1993 was ascertained from data provided by the Central Statistical Office of Finland.

Kaplan–Meier survival analysis was used, the differences in survival functions between groups being assessed with the log rank test. The cross-tabulation data for the groups and diagnoses as indicated on the death certificates were tested with the Pearson χ^2 test. SPSS for Windows, release 6·1, was used for the statistical calculations.

Results

SURVIVAL

In the course of an average follow-up of 8·5 yr (SD 4·6 yr), 19·0% of the patients had died. Survival was higher among the asthma patients and lower in the COPD and mixed groups (Table 1).

The median survival time for all the COPD patients was 14·5 yr [95% confidence interval (CI) 13·7–15·4 yr] and that for all the mixed group patients 14·1 yr (95% CI 12·7–15·6 yr). Of the asthmatics, 75% were still alive at the maximal survival time, which was limited to 17·7 yr. Men with COPD had the worst prognosis, with a median survival time of 12·8 yr (95% CI 11·9–13·7 yr) (Figs 1 and 2).

The asthma patients had a better prognosis than either the COPD patients or the mixed group (P=0·0000 *vs.* both groups among both men and women), but there was no significant difference between the COPD patients and the mixed group in either the men (P=0·0756) or the women (P=0·0995). Women had a better prognosis than men in all three disease groups (P=0·0000, P=0·0000 and P=0·0023, respectively).

CAUSE OF DEATH

Coronary heart disease was the most common main cause of death mentioned on the certificate (24·2%) of the study

TABLE 1. Estimated cumulative 10 yr survival rates for hospitalized Finnish asthma, COPD and mixed group patients aged from 50 to 54 years, calculated from the time of first treatment in hospital

	No. of patients	No. of deaths	Survival (%) after 10 yr (standard error)
Men			
Asthma	2783	422	83·5 (0·9)
COPD	2095	855	60·1 (1·2)
Mixed	480	194	62·5 (2·5)
All	5358	1471	71·7 (0·7)
Women			
Asthma	3872	255	93·2 (0·5)
COPD	632	118	78·0 (2·0)
Mixed	221	67	74·4 (3·3)
All	4725	440	90·2 (0·5)
All subjects	10 083	1911	80·2 (0·5)

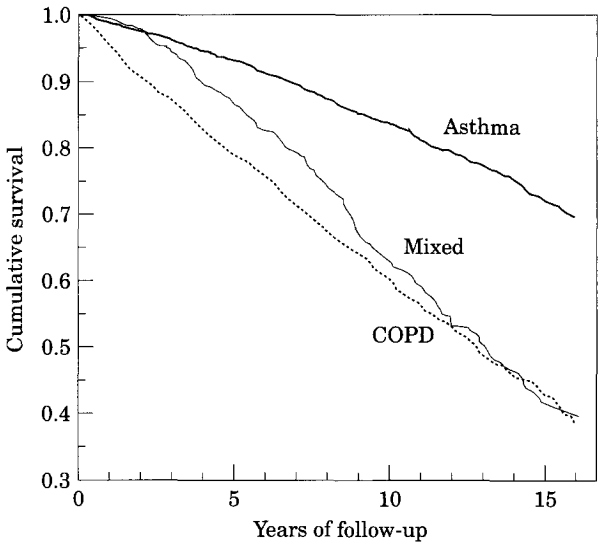

FIG. 1. Comparison of survival rates for male Finnish asthma, COPD and mixed group patients aged from 50 to 54 years.

population, and was not unusual among the women (Table 2), although it was more prevalent in the men (P=0·0000). COPD was the second commonest cause of death (17·4%) and was less frequent in the men, but the difference was not significant. Asthma accounted for 6·0% of all deaths of patients with obstructive pulmonary diseases, and was more widespread as a cause of death in the women (P=0·0000).

Of the deaths in the asthma group, 12·1% had asthma as the main cause and 5·5% COPD, even though these patients had had no hospital admissions for COPD. Asthma was a rare cause of death in the COPD group, however, but COPD was common. The male COPD patients nevertheless had more cases of coronary ischaemia as the cause of death than of COPD. Although the mixed group contained

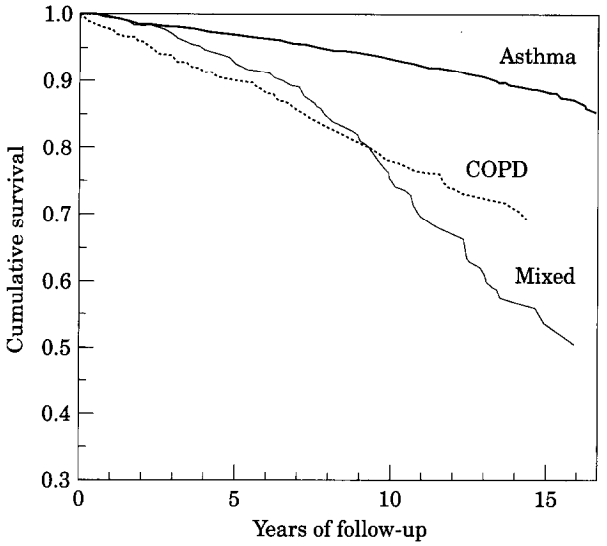

FIG. 2. Comparison of survival rates for female Finnish asthma, COPD and mixed group patients aged from 50 to 54 years.

patients with both diagnoses, COPD was almost four times more prevalent than asthma.

Discussion

The discharge register maintained by the National Research and Development Centre for Welfare and Health is an extensive one, covering all private, public, general and mental hospitals in Finland, and the correspondence between its diagnosis data and patient records has been found to be good (5). The diagnoses indicated in it are based on evaluations made by the doctors in the wards. The diagnoses quoted in the cause of death register are somewhat less consistent, however, as death certificates are issued by specialists in different fields of medicine in different departments, home care situations and cases of accident or of death occurring at home, and in many instances by pathologists on the basis of autopsy findings (6). The clinician attending the patient during life is seldom the writer of the death certificate. Thus the diagnosis in the discharge register may correspond better to the actual nature of the disease. Since we have here a collection of data on a national scale covering a period of over 20 yr in which the same patients can be traced in the hospital discharge and cause of death registers by reference to their social security numbers, the results obtained can be said to be unique.

The results indicate that the hospital doctors were generally successful in distinguishing between asthma and COPD and underline the importance of their differential diagnosis. It is believed nowadays that treatment of asthma at an early stage can prevent it from developing into a chronic disease, obviate the need for hospital treatment and reduce the risk of death. They confirm earlier observations that persons suffering from asthma alone do not have such a high risk of death as COPD patients or persons with both conditions (7,8). If the patient has some other obstructive pulmonary disease in addition to asthma, however, the prognosis is not

TABLE 2. Main causes of death (%) indicated on the death certificates of Finnish asthma, COPD and mixed group patients aged from 50 to 54 years after an average follow-up of 8·4 yr from the time of first treatment in hospital

	Men			Women		
Diagnosis	Asthma	COPD	Mixed	Asthma	COPD	Mixed
Asthma	10·4	0·8	6·2	14·9	2·6	14·9
COPD	6·4	21·4	29·4	3·9	27·1	34·3
Other pulmonary disease	0·9	3·5	2·1	1·2	2·6	3·0
Pulmonary carcinoma	8·1	12·9	12·9	5·5	10·2	4·5
Other tumours	10·0	7·8	9·3	25·1	10·2	1·5
Coronary ischaemia	30·1	26·7	20·6	16·5	11·0	17·9
Stroke	6·4	4·2	3·6	10·2	7·6	4·5
Other circulatory diseases	7·8	7·3	5·1	8·2	7·6	4·5
Violence or accident	12·6	7·6	7·2	6·3	4·2	1·5
Other causes	7·3	7·8	3·6	8·2	16·9	13·4
All diagnoses	100·0	100·0	100·0	100·0	100·0	100·0

International classification of disease: asthma (493), COPD (491, 492 and 496), other pulmonary diseases (460–519, except 491–493 and 496), pulmonary carcinoma (162), other tumours (140–239, except 162), coronary ischaemia (410–414), stroke (430–438), other circulatory diseases (390–459, except 410–414 and 430–438), violence or accident (E classification).

so good. COPD is a progressive disease for which there is no effective treatment, and it usually manifests itself in more elderly patients who have other complaints as well, which further detracts from the prognosis (4). Our present observations support earlier findings that indicate that COPD and asthma are separate diseases (8,9).

It is essential to be aware of the practices involved in the assigning of causes of death in order to evaluate these causes and the resulting mortality statistics (10). The most common causes of death are the cardiovascular diseases that are so widespread among the Finns, because the last institution responsible for treating the patient will always seek to give a diagnosis that links the case with that institution and the last instance of treatment that the patient received and, since cardiovascular research has advanced further than that into pulmonary diseases, such causes of death are more easily accepted (11). The recording of cardiac deaths may also be explained by the fact that many patients may suffer from hypoxaemia in the stable phase of COPD, whereupon the risk of infarction during an exacerbation of the latter will increase as hypoxaemia becomes more serious. Hospital treatment for heart infarction patients over 70 years of age becomes more complicated if they also have COPD, and mortality after discharge from hospital is higher (12). On the other hand, mortality also increases if asthma, chronic obstructive bronchitis, pneumonia or bronchitis is erroneously treated as cardiac insufficiency (13).

Our present patients rarely had asthma as their cause of death even though they may previously have had periods of hospitalization for asthma, in spite of the fact that re-admissions for asthma entail a risk of death (14). The results support the notion that asthma is underrated as a cause of death in Finland. Mortality from asthma is low in this country (15), partly because treatment is still concentrated in hospitals. Also, although asthma is very carefully defined as a cause of death among persons aged under 35 years, it accounts for only about a third of the causes of death among asthmatics over this age (16). Elderly people, for instance, frequently have multiple diseases and a previous diagnosis of asthma is easily overlooked.

The fact that mortality among men was higher than that among women in all the diagnostic groups is connected with the shorter mean life expectancy for men in Finland. Thus while the mean further expectation of life for 55 year old Finnish men in 1986 was 20·3 yr, the figure for women of the same age was 26·0 yr (17). It should be noted that smoking is more common among men than among women in this age group and that men have a higher incidence of COPD. It has also been shown that female asthmatics make more use of hospital services than do male asthmatics and that the men begin to use such services at a more advanced age (18). In the light of these observations, one is led to suspect that many of the male asthmatics are already in the chronic phase of the disease by the time they report for hospital treatment or that the asthma experienced by the men is a different disease, closer to COPD in character. Even so, obstructive pulmonary diseases are more easily accepted as causes of death for women, whereas cardiovascular diseases would appear to be the principal category for men, a trend possibly related to the popular concept of their widespread occurrence in the Finnish population.

Obstructive pulmonary diseases may well be of considerably greater significance in public health terms than the register of causes of death would suggest. Certainly it can be shown by combining this register with the hospital discharge statistics that the prognosis for 50–54 year old COPD patients treated in hospital is poor, to the extent that only a half of them survive to reach retirement age. For this reason alone it is essential to consider all possibilities for active treatment and prevention when evaluating a patient who has been admitted to hospital for the first time with COPD.

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